PM 2-L

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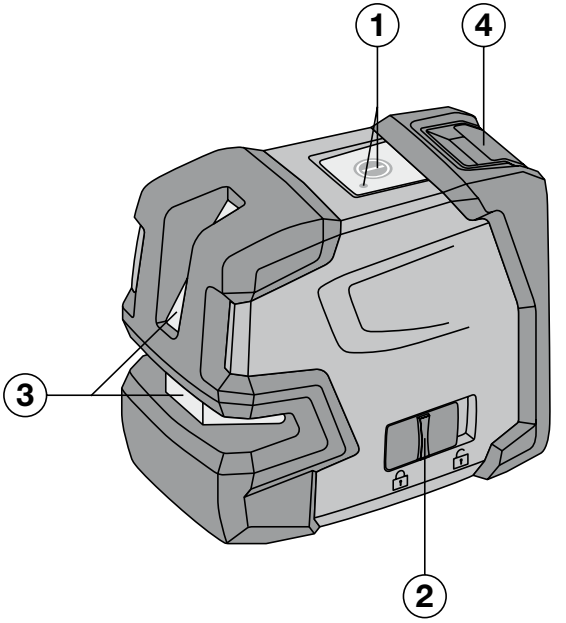

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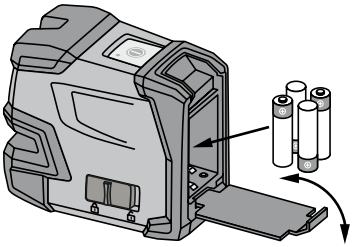

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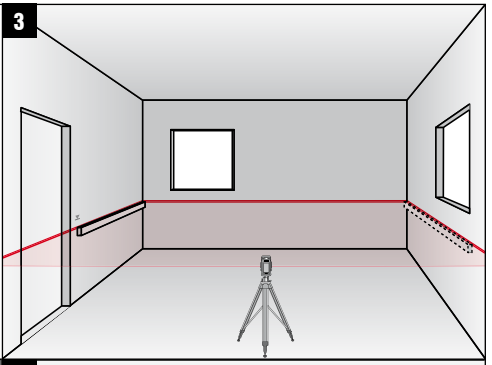

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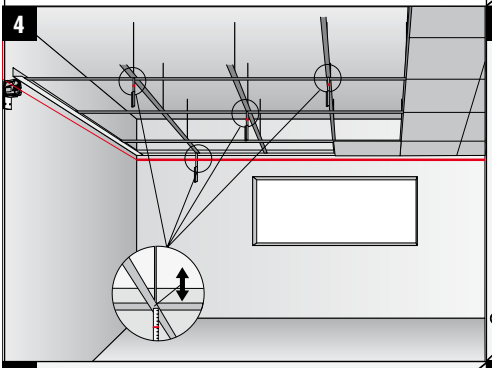

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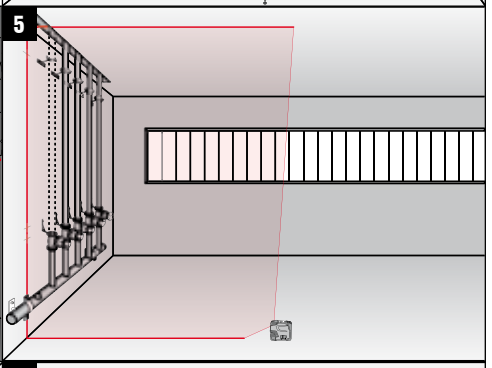

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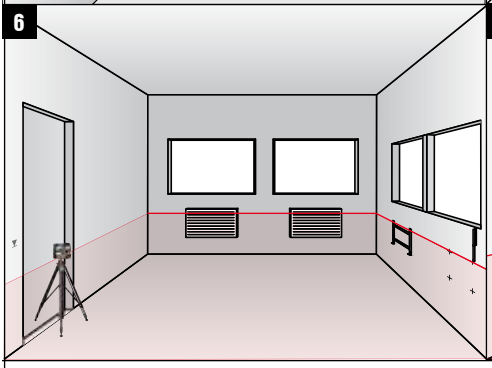

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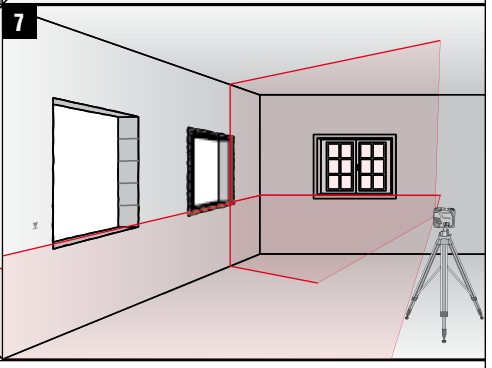

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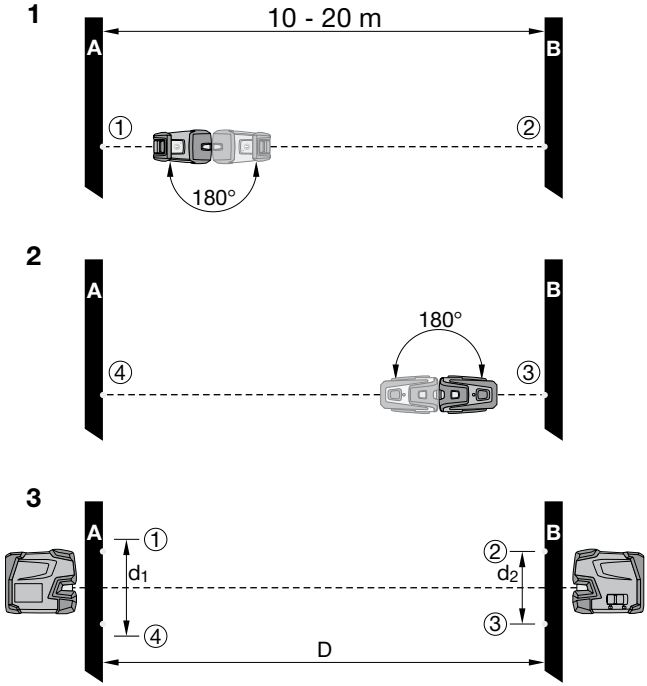
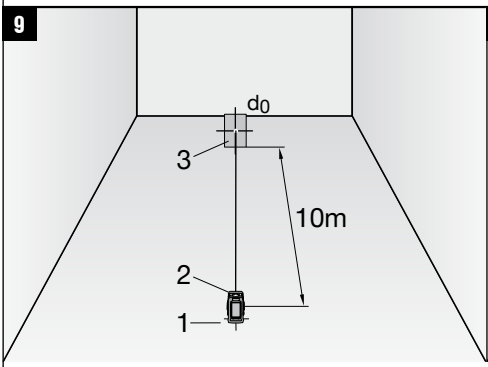
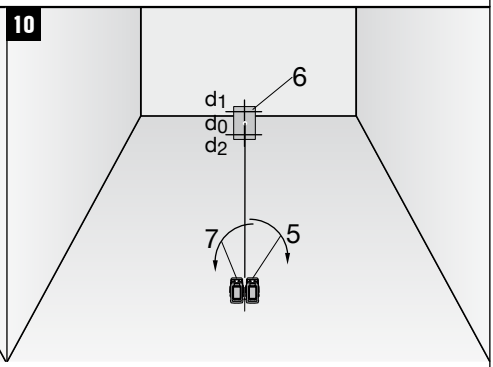

1
10 - 20 m
A
B
①
②
180°
2
A
B
180°
④
③
3
A
①
d1
④
B
②
d2
③
D

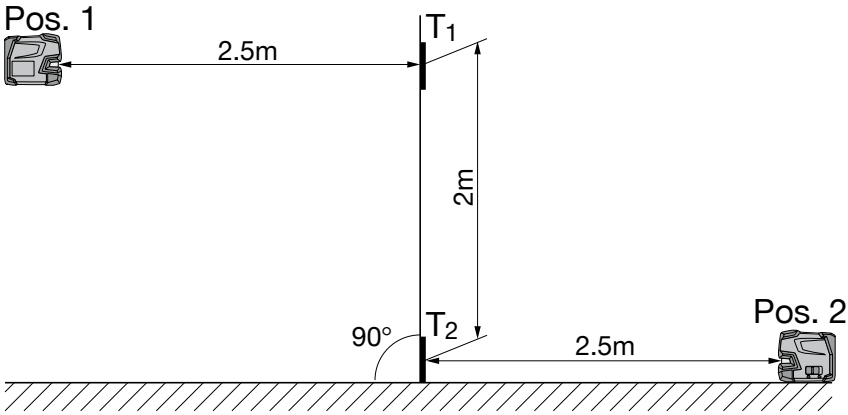
9


d0
3
10m
2
1

10


6
d1
d0
d2
7
5

11



ORIGINAL OPERATING INSTRUCTIONS

PM 2-L line laser

It is essential that the operating instructions are read before the tool is operated for the first time.

Always keep these operating instructions together with the tool.

Ensure that the operating instructions are with the tool when it is given to other persons.

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1 These numbers refer to the corresponding illustrations. The illustrations can be found on the fold-out cover pages. Keep these pages open while studying the operating instructions.
In these operating instructions, the designation "the tool" always refers to the PM 2-L line laser.

Parts, operating controls and indicators 1

① On/off button with LED
② Slide switch for pendulum locking mechanism
③ Laser exit window
④ Battery compartment

1. General information

1.1 Safety notices and their meaning

DANGER
Draws attention to imminent danger that will lead to serious bodily injury or fatality.

WARNING
Draws attention to a potentially dangerous situation that could lead to serious personal injury or fatality.

CAUTION
Draws attention to a potentially dangerous situation that could lead to slight personal injury or damage to the equipment or other property.

NOTE
Draws attention to an instruction or other useful information.

1.2 Explanation of the pictograms and other information

Warning signs

General warning

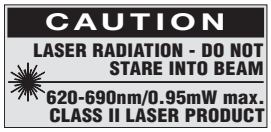
en

Symbols

Read the operating instructions before use.

Disposal of power tools or appliances and batteries together with household waste is not permissible.

On the tool



Do not stare into the beam.
Laser warning plates for the USA in accordance with CFR 21 § 1040 (FDA).

On the tool

Laser radiation. Do not look into the beam. Laser class 2.
Laser warning plate according to IEC60825/EN60825-1:2007

Location of identification data on the tool
The type designation and serial number can be found on the type identification plate on the tool. Make a note of this data in your operating instructions and always refer to it when making an enquiry to your Hilti representative or service department.

Type:

Generation: 01

Serial no.:

2. Description

2.1 Use of the product as directed

The PM 2-L is a self-leveling line laser which allows leveling and alignment work to be carried out quickly and accurately by a single person. The tool projects two laser lines (horizontal and vertical) and a line intersection point. The lines and line intersection point have a range of approx. 10 m. Range depends on the brightness of ambient light.
The tool is designed for mainly indoor use and is no substitute for a rotating laser.
When used for outdoor applications, care must be taken to ensure that the general conditions are similar to those encountered indoors. Possible applications are:
Leveling power outlets, cable trays, radiators and in other items in installation work.
Leveling suspended ceilings.
Leveling and aligning doors and windows.
Transferring heights.
Vertical alignment of pipes.
Observe the information printed in the operating instructions concerning operation, care and maintenance.
Modification of the tool is not permissible.
To avoid the risk of injury, use only genuine Hilti accessories and insert tools.
The tool and its ancillary equipment may present hazards when used incorrectly by untrained personnel or when used not as directed.

2.2 Features

The PM 2-L levels itself automatically within a range of approx. 4°.
Self-leveling takes only approx. 3 seconds.
When the self-leveling range is exceeded, the laser beams blink to warn the user.
The PM 2-L is characterized by its ease of operation and use, its rugged plastic casing and ease of transport due to its compact dimensions and light weight.

The tool can be used together with the PMA 31 laser receiver.
In the normal operating mode, the tool switches itself off after 1 hour. Sustained operating mode can be activated by pressing and holding the on/off button for four seconds.

2.3 Items supplied with the cardboard box version

1 Line laser
1 Soft pouch
4 Batteries
1 Operating instructions
1 Manufacturer's certificate

2.4 Information displayed during operation

LED	The LED does not light.	The tool is switched off.
	The LED does not light.	The batteries are exhausted.
	The LED does not light.	The batteries are inserted incorrectly.
	The LED lights constantly.	The laser beam is switched on. The tool is in operation.
	The LED blinks twice every 10 seconds (pendulum not locked) or every 2 seconds (pendulum locked).	The batteries are almost exhausted.
	The LED blinks.	The tool is switched off but the pendulum is not locked.
Laser beam	The laser beam blinks twice every 10 seconds (pendulum not locked) or every 2 seconds (pendulum locked).	The batteries are almost exhausted.
	The laser beam blinks five times and then remains permanently on.	Automatic power-off has been deactivated.
	The laser beam blinks rapidly.	The tool is unable to level itself (Outside the self-leveling range).
	The laser beam blinks every 2 seconds.	Inclined line operating mode. The pendulum is locked, as a result of which the lines are not leveled.

3. Accessories

Designation	Short designation	Description
Tripod	PMA 20	
Target plate	PMA 54/55	
Target plate	PRA 50/51	
Laser receiver	PMA 31	
Telescopic brace	PUA 10	

Designation	Short designation	Description
Universal adapter	PMA 78	
Laser visibility glasses	PUA 60	The laser visibility glasses are not protective glasses and thus do not protect the eyes from laser beams. As the laser visibility glasses restrict color vision, they should be worn only when working with the PM 2-L laser tool. Do not wear the laser visibility glasses while driving a vehicle on a public road.

4. Technical data

Right of technical changes reserved.

Range of the lines and intersection point	without laser receiver: 10 m (33 ft) with laser receiver: 30 m (98 ft)
Level of accuracy setting at room temperature +24 °C (75 °F) [1]	±3.0 mm at 10 m (±⅛ in at 33 ft)
Self-leveling time	3 s (typical)
Laser class	Class 2, visible, 620 - 690 nm, ±10 nm (EN 60825-1:2007 / IEC 60825 - 1:2007); class II (CFR 21 §1040 (FDA)
Line width	Distance 5 m: < 2.2 mm
Self-leveling range	±4° (typical)
Automatic power-off	Activated after: 1 h
Operating status indicator	LED and laser beams
Power supply	AA-size batteries, Alkaline batteries: 4
Battery life	Alkaline battery 2,500 mAh, Temperature +24°C (+75 °F): 14 h (typical)
Operating temperature	Min. -10°C / Max. +50°C (+14 to 122 °F)
Storage temperature	Min. -25°C / Max. +63°C (-13 to 145 °F)
Dust and water spray protection (except battery compartment)	IP 54 as per IEC 529
Tripod thread (tool)	UNC¼"
Weight	Without batteries: 0.43 kg (0.95 lbs)
Dimensions	65 x 107 x 95 mm (2 ½ x 4 ¼ x 3 ¾ in)

[1] Influences such as, in particular, high temperatures, moisture, shock, fall, etc. may lead to deviations from the level of accuracy which was set.

5. Safety instructions

WARNING: Ensure that you read all safety precautions and instructions. Failure to observe the safety precautions and instructions may result in electric shock, fire and/or serious injury.**Retain all safety precautions and instructions for future reference.**

5.1 General safety measures

a) **Check the accuracy of the tool before using it to take measurements.**
b) **The tool and its ancillary equipment may present hazards when used incorrectly by untrained personnel or when used not as directed.**
c) **To avoid the risk of injury, use only genuine Hilti accessories and additional equipment.**
d) **Stay alert, watch what you are doing and use common sense when operating the machine. Don't use the machine when you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating machines may result in serious personal injury.
e) **Modification of the tool is not permissible.**
f) **Observe the information printed in the operating instructions concerning operation, care and maintenance.**
g) **Do not render safety devices ineffective and do not remove information and warning notices.**
h) **Keep children and other persons away from the area while the tool or appliance is in use.**
i) **Take the influences of the surrounding area into account. Do not expose the tool to rain or snow and do not use it in damp or wet conditions. Do not use the tool where there is a risk of fire or explosion.**
j) **Maintain the machine carefully. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the machine's operation. If damaged, have the machine repaired before use.** Poor maintenance is the cause of many accidents.
k) **Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.
l) **The user must check the accuracy of the tool after it has been dropped or subjected to other mechanical stresses.**
m) **When the tool is brought into a warm environment from very cold conditions, or vice-versa, allow it to become acclimatized before use.**
n) **Make sure that the tool is mounted securely when adapters or accessories are used.**
o) **Keep the laser exit aperture clean to avoid measurement errors.**
p) **Although the tool is designed for the tough conditions of jobsite use, as with other optical and electronic instruments (e.g. binoculars, spectacles, cameras) it should be treated with care.**
q) **Although the tool is protected to prevent entry of dampness, it should be wiped dry each time before being put away in its transport container.**
r) **Check the accuracy of the measurements several times during use of the tool.**

5.2 Proper organization of the workplace

a) **Secure the area in which you are working and take care to avoid directing the beam towards other persons or towards yourself when setting up the tool.**
b) **Avoid unfavorable body positions when working from ladders. Make sure you work from a safe stance and stay in balance at all times.**
c) Measurements taken through panes of glass or other objects may be inaccurate.
d) **Ensure that the tool is set up on a steady, level surface (not subject to vibration).**
e) **Use the tool only within its specified limits.**
f) **If several laser tools are used in the same working area, care must be taken to avoid confusing the beams.**
g) Magnetic fields may affect the accuracy of the tool. It must thus be kept away from magnetic objects. The tool is not affected by the Hilti universal adapter.
h) **When working with the receiver, it must be held exactly at right angles to the laser beam.**
i) Do not use the tool in the proximity of medical instruments.

5.3 Electromagnetic compatibility

Although the tool complies with the strict requirements of the applicable directives, Hilti cannot entirely rule out the possibility of the tool being subject

to interference caused by powerful electromagnetic radiation, leading to incorrect operation. Check the accuracy of the tool by taking measurements by other means when working under such conditions or if you are unsure. Likewise, Hilti cannot rule out the possibility of interference with other devices (e.g. aircraft navigation equipment).

5.4 Laser classification for laser class 2/class II tools

Depending on the version purchased, the tool complies with Laser Class 2 in accordance with IEC825-1:2007 / EN60825-1:2007 and Class II in accordance with CFR 21 § 1040 (FDA). This tool may be used without need for further protective measures. The eyelid closure reflex protects the eyes when a person looks into the beam unintentionally for a brief moment. This eyelid closure reflex, however, may be negatively affected by medicines, alcohol or drugs. Nevertheless, as with the sun, one should not look directly into sources of bright light. Do not direct the laser beam toward persons.

5.5 Electrical

a) Insulate or remove the batteries before shipping the tool.

b) **To avoid pollution of the environment, the tool must be disposed of in accordance with the currently applicable national regulations. Consult the manufacturer if you are unsure of how to proceed.**

c) **Keep the batteries out of reach of children.**

d) **Do not allow the batteries to overheat and do not expose them to fire.** The batteries may explode or release toxic substances.

e) **Do not charge the batteries.**

f) **Do not solder the batteries into the tool.**

g) **Do not discharge the batteries by short circuiting as this may cause them to overheat and present a risk of personal injury (burns).**

h) **Do not attempt to open the batteries and do not subject them to excessive mechanical stress.**

i) **Do not use damaged batteries.**

j) **Do not mix old and new batteries. Do not mix batteries of different makes or types.**

5.6 Liquids

Under abusive conditions, liquid may leak from the battery. **Avoid contact. If contact accidentally occurs, flush with water. In the event of the liquid coming into contact with the eyes, rinse the eyes with plenty of water and consult a doctor.** Liquid ejected from the battery may cause irritation or burns.

6. Before use

6.1 Inserting the batteries 2

DANGER
Use only new batteries.

1. Open the battery compartment.
2. Remove the batteries from the packaging and insert them in the tool.
   NOTE Only batteries recommended by Hilti may be used to power the tool.
3. Check that the battery terminals are positioned correctly as shown on the underside of the unit.
4. Close the battery compartment. Check that the catch engages properly.

7. Operation

NOTE
To achieve maximum accuracy, project the line onto a vertical, flat surface. When doing so, set up the tool at 90° to the surface.

7.1 Operation

7.1.1 Switching the laser beams on

1. Unlock the pendulum.
2. Press the on/off button once or repeatedly until the desired operating mode is set:
   NOTE The tool switches between the operating modes according to the sequence shown below and then starts again from the beginning provided that the on/off button is pressed again within 5 seconds each time.
   Horizontal laser line
   Vertical laser line
   Vertical and horizontal laser lines

7.1.2 Switching the tool/laser beams off

Press the on/off button until the laser beam is no longer visible and the LED goes out.
NOTE
- The tool can be switched off if the on/off button has not previously been pressed for at least 5 seconds.
- The tool switches itself off automatically after approx. 1 hour.

7.1.3 Deactivating the automatic power-off feature

Press and hold the on/off button for approx. 4 sec. until the laser beam blinks five times as confirmation.
NOTE
The tool will be switched off when the on/off button is pressed or when the batteries are exhausted.

7.1.4 Inclined line function

Lock the pendulum.
The tool does not level itself automatically.
The laser beam(s) blink(s) every two seconds.

7.1.5 Using the tool with the PMA 31 laser receiver

For further information, please refer to the PMA 31 operating instructions.

7.2 Examples of applications

7.2.1 Transferring heights 3

7.2.2 Aligning suspended ceilings 4

7.2.3 Aligning pipes vertically 5

7.2.4 Aligning radiators 6

7.2.5 Aligning door and window frames 7

7.3 Checking

7.3.1 Checking the leveling of the horizontal laser beam 8

1. Place the tool on an even, level surface approx. 20 cm from the wall (A) with the laser beam directed toward the wall (A).
2. Mark the point of intersection of the laser lines on the wall (A) with a cross (1).
3. Turn the tool through 180° and mark the point of intersection of the laser lines on the opposite wall (B) with a cross (2).
4. Place the tool on an even, level surface approx. 20 cm from the wall (B) with the laser beam directed toward the wall (B).
5. Mark the point of intersection of the laser lines on the wall (B) with a cross (3).
6. Turn the tool through 180° and mark the point of intersection of the laser lines on the opposite wall (A) with a cross (4).
7. Measure the distances d1 between (1) and (4) and d2 between (2) and (3).

8. Mark the mid points of d1 and d2.
   If the reference points 1 and 3 are located on different sides of the mid point, then subtract d2 from d1.
   If the reference points 1 and 3 are located on the same side of the mid point, then add d1 and d2 together.
9. Divide the result by twice the length of the room (room length x 2).
   The maximum permissible error is 3 mm.

7.3.2 Checking the accuracy of the horizontal line 9 10

1. Place the tool at the edge of a room with a length of at least 10 m.
   NOTE The floor surface must be even and level.
2. Switch on all laser beams.
3. Set up a target plate at a distance of at least 10 m from the tool, so that the point of intersection of the laser lines lies in the center of the target plate (d0) and the vertical line on the target plate runs exactly through the middle of the vertical laser line.
4. Pivot the tool clockwise through 45° (as seen from above).
5. Then mark the point (d1) on the target plate where the horizontal laser line strikes the vertical line on the target plate.
6. Pivot the tool counterclockwise through 90°. The reference point must remain on the center of the reference cross.
7. Then mark the point (d2) on the target plate where the horizontal laser line strikes the vertical line on the target plate.
8. Measure the following vertical distances: d0-d1, d0-d2 and d1-d2.
   NOTE The greatest measured vertical distance must be no more than 5 mm at a working distance of 10 m.

7.3.3 Checking the vertical lines 11

1. Position the tool at a height of 2 meters.
2. Switch the tool on.
3. Position the first target plate T1 (vertical) at a distance of 2.5 meters from the tool at the same height (2 meters), so that the vertical laser beam strikes the plate. Mark this position.
4. Then place the second target plate T2 at a position 2 meters below the first target plate, so that the vertical laser beam strikes the plate. Mark this position.
5. Mark position 2 at the opposite side of the test setup (mirror image) on the laser line on the floor at a distance of 5 meters from the tool.
6. Now place the tool on the floor on the mark for position 2 which you have just made. Direct the laser beam toward the target plates T1 and T2 so that it strikes the plates close to their center lines.
7. Read the distances D1 and D2 from each target plate (distance of the laser line from the center of the target plate) and calculate the difference (D = D1 - D2).
   NOTE Take care to ensure that the target plates are parallel to each other and that they are in the same vertical plane. (Horizontal alignment may result in measurement error).
   If the difference D is greater than 3 mm, the tool must be returned to a Hilti repair center for readjustment.

8. Care and maintenance

8.1 Cleaning and drying

1. Blow dust off the glass.
2. Do not touch the glass with the fingers.
3. Use only a clean, soft cloth for cleaning. If necessary, moisten the cloth slightly with pure alcohol or a little water.
   NOTE Do not use any other liquids as these may damage the plastic components.
4. Observe the temperature limits when storing your equipment. This is particularly important in winter / summer if the equipment is kept inside a motor vehicle (-25°C to +60°C).

8.2 Storage

Remove the tool from its case if it has become wet. The tool, its carrying case and accessories should be

cleaned and dried (at maximum 63°C / 145°F). Repack the equipment only once it has dried completely and then store it in a dry place.
Check the accuracy of the equipment before it is used after a long period of storage or transportation.
Remove the batteries from the tool before storing it for a long period. Leaking batteries may damage the tool.

8.3 Transport

Use the Hilti toolbox or packaging of equivalent quality for transporting or shipping your equipment.
CAUTION
Always remove the batteries before shipping the tool.

8.4 Hilti calibration service

We recommend that the tool is checked by the Hilti calibration service at regular intervals in order to verify its reliability in accordance with standards and legal requirements.
Use can be made of the Hilti calibration service at any time, but checking at least once a year is recommended.
The calibration service provides confirmation that the tool is in conformance, on the day it is tested, with the specifications given in the operating instructions. The tool will be readjusted if deviations from the manufacturer's specification are found. After checking and adjustment, a calibration sticker applied to the tool and a calibration certificate provide written verification that the tool operates in accordance with the manufacturer's specification.
Calibration certificates are always required by companies certified according to ISO 900x.
Your local Hilti Center or representative will be pleased to provide further information.

9. Troubleshooting

Fault	Possible cause	Remedy
The tool cannot be switched on.	The battery is exhausted.	Replace the battery.
	The battery is inserted the wrong way round (incorrect polarity).	Insert the battery correctly.
	The battery compartment is not closed.	Close the battery compartment.
	The tool or the on/off button is faulty.	If necessary, the power tool should be repaired by Hilti Service.
Individual laser beams don't function.	The laser source or laser control unit is faulty.	If necessary, have the power tool repaired by Hilti Service.
The tool can be switched on but no laser beam is visible.	The laser source or laser control unit is faulty.	If necessary, have the power tool repaired by Hilti Service.
	The temperature is too high or too low.	Allow the tool to cool down or warm up.
Automatic leveling doesn't function.	The tool is set up on an excessively inclined surface.	Set up the tool on the level.
	The tilt sensor is faulty.	If necessary, have the power tool repaired by Hilti Service.

10. Disposal

WARNING

Improper disposal of the equipment may have serious consequences:
The burning of plastic components generates toxic fumes which may present a health hazard.
Batteries may explode if damaged or exposed to very high temperatures, causing poisoning, burns, acid burns or environmental pollution.
Careless disposal may permit unauthorized and improper use of the equipment. This may result in serious personal injury, injury to third parties and pollution of the environment.

Most of the materials from which Hilti tools or appliances are manufactured can be recycled. The materials must be correctly separated before they can be recycled. In many countries, Hilti has already made arrangements for taking back old tools and appliances for recycling. Ask Hilti Customer Service or your Hilti representative for further information.

For EC countries only

Disposal of electric appliances together with household waste is not permissible.

In observance of European Directive 2002/96/EC on waste electrical and electronic equipment and its implementation in accordance with national law, electric tools that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

Dispose of the batteries in accordance with national regulations.

11. Manufacturer's warranty

Hilti warrants that the tool supplied is free of defects in material and workmanship. This warranty is valid so long as the tool is operated and handled correctly, cleaned and serviced properly and in accordance with the Hilti Operating Instructions, and the technical system is maintained. This means that only original Hilti consumables, components and spare parts may be used in the tool.

This warranty provides the free-of-charge repair or replacement of defective parts only over the entire lifespan of the tool. Parts requiring repair or replacement as a result of normal wear and tear are not covered by this warranty.

Additional claims are excluded, unless stringent national rules prohibit such exclusion. In particular, Hilti is not obligated for direct, indirect, incidental or consequential damages, losses or expenses in connection with, or by reason of, the use of, or inability to use the tool for any purpose. Implied warranties of merchantability or fitness for a particular purpose are specifically excluded.

For repair or replacement, send the tool or related parts immediately upon discovery of the defect to the address of the local Hilti marketing organization provided.

This constitutes Hilti's entire obligation with regard to warranty and supersedes all prior or contemporaneous comments and oral or written agreements concerning warranties.

12. FCC statement (applicable in USA)

CAUTION
This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and may radiate radio frequency energy. Accordingly, if not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

Re-orient or relocate the receiving antenna.

Increase the distance between the tool and receiver.

Consult your dealer or an experienced TV/radio technician for assistance.

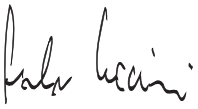
NOTE
Changes or modifications not expressly approved by Hilti may restrict the user's authorization to operate the equipment.

13. EC declaration of conformity (original)

Designation:	Line laser
Type:	PM 2-L
Year of design:	2012

We declare, on our sole responsibility, that this product complies with the following directives and standards: 2004/108/EC, 2006/95/EC, 2011/65/EU, EN 12100.

Hilti Corporation, Feldkircherstrasse 100, FL-9494 Schaan



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